



High haplotype diversity in a microendemic Malagasy gecko species, *Lygodactylus mirabilis* (Pasteur, 1962)

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Abstract

Among Malagasy montane reptiles, the diurnal gecko *Lygodactylus mirabilis* has one of the most restricted distribution ranges, occurring only on the Tsiafajavona mountain on the Ankaratra massif. Here we report data on the current distribution of this species and its genetic diversity. Mitochondrial data based on samples collected in the only previously known distribution area (the Tsiafajavona peak) showed numerous haplotypes at low frequencies, suggesting a past population expansion and a relatively high within-species genetic diversity in an extremely small distribution area. Our field survey also revealed that the range of the species is larger than previously thought, but still is extremely small and restricted to the Ankaratra massif.

Key words: Madagascar, *Lygodactylus*, 16S rRNA, Cytochrome *b*, Mountain microendemism

Introduction

Madagascar has been proposed as a good study system for understanding the patterns and processes of species diversification (Vences *et al.* 2009). Recent publications (Vences *et al.* 2009; Vieites *et al.* 2009) have revealed an astonishingly high number of undescribed species on the island (see Vences *et al.* 2009 for a list of recent publications on cryptic Malagasy species). Previous studies have shown that tropical montane habitats are especially important to herpetofaunal diversity in Madagascar (e.g., Raxworthy & Nussbaum 1996), because they exhibit a large degree of local endemism, with some species occurring only at high elevation with extremely limited distribution areas (Raxworthy 2003).

Out of the about 90 currently described Malagasy gecko species, 22 belong to the genus *Lygodactylus* (Glaw & Vences 2007; Puente *et al.* 2009). This genus includes 60 recognized species mostly distributed in Africa and Madagascar, with a few species in South America (Bauer 2003). *Lygodactylus* are small, diurnal geckos, normally less than 40 mm in snout-vent length (Pasteur 1964). In Madagascar, six *Lygodactylus* species are known to live above 1500 m altitudes, on a mountain chain that spans the island longitudinally and is otherwise known as the high plateau. *Lygodactylus mirabilis* (Pasteur 1962), only known to live in the highest elevation area on Tsiafajavona mountain on the Ankaratra massif, seems to be the species with the most adapted morphology to its environment among the montane dwarf geckos of Madagascar, with strongly